EPA

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number: 3-14

☐ Other ☐ Amendment Number:

Contract Number	Contract Period	Title of Work Assignment/SF Site Name
EP-D-11-006	04/29/2011 To 03/31/2014 Base Option Period Number 2	Boiler MACT ICR PM Emissions

Contractor: EASTERN RESEARCH GROUP, INC.

Specify Section and paragraph of Contract SOW: Sec II, K and L

Purpose:
- [X] Work Assignment
- [ ] Work Assignment Amendment
- [ ] Work Plan Approval
- [ ] Work Assignment Close-Out
- [ ] Incremental Funding

Period of Performance: From 07/30/2013 To 03/31/2014

Comments:
This is the initiation of a work assigment for the Option II period. Hours have been authorizd for the work plan and also for work to begin (400 hours). The contractor is to propose hours for the entire Statement of Work (attached). This work does not duplicate any work previouly performed or is currently being performed.

☐ Superfund — Accounting and Appropriations Data — [X] Non-Superfund

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

SFO (*Max 2*) ☐

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

Contract Period: 04/29/2011 To 03/31/2014 — Cost/Fee: — LOE:

This Action:

Total:

Work Plan / Cost Estimate Approvals

Contractor WP Dated: — Cost/Fee: — LOE:

Cumulative Approved: — Cost/Fee: — LOE:

Work Assignment Manager Name: Venkatesh Rao (Signature) (Date)	Branch/Mail Code:	
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Project Officer Name: Karen C. Watson (Signature) (Date)	Branch/Mail Code:	
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	FAX Number:	

Contractor: Eastern Research Group
Contract Number: ERG - EP-D-11-006 Option Period II
Work Assignment Number: 3-14

I. Title: Review, Analysis, and Reporting of Boiler MACT ICR PM Emissions Data

Work Assignment Manager (WAM):
Venkatesh Rao
U. S. Environmental Protection Agency
Office of Air Quality Planning and Standards (OAQPS)
Emissions Inventory and Analysis Group (EIAG) (MD-C339-02)
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Alternate WAM: Lee Tooly, 919-541-5292, (MD-C339-02)

II. **Project Background:**

The EPA's National Emission Inventory (NEI) includes emission estimates for particulate matter (PM) as PM10 Filterable, PM2.5 Filterable, PM Condensible, PM10 Primary (Filt + Cond), and PM2.5 Primary (Filt + Cond). The Primary values are abbreviated as PM25-PRI and PM10-PRI. EPA requests the states/ local/ tribal (SLT) agencies report PM as filterable PM and condensable PM. Filterable particulate material are directly emitted as solid or liquid at stack or release conditions and captured on the filter of a stack test train (abbreviated PM10-FIL and PM25-FIL) . Condensable material is in the vapor phase at stack conditions but condenses and/or reacts upon cooling and dilution in the ambient air to form a solid or liquid particle immediately after discharge from the effluent. Condensable PM is always PM2.5 or less (abbreviated PM-CON).

As part of developing the NEI, EPA augments the PM data submitted by SLTs to ensure completeness of the PM components in the final NEI and to ensure that agencies' data does not contain inconsistencies. An example of inconsistency is data submitted for the same source and emissions process that contains a reported PM25-FIL value that is greater than the reported PM25-PRI. Starting with the 2011 NEI, QA checks on data submissions that prevent a user from reporting certain inconsistencies such as a value of PM10 that is less than PM2.5 for either filterable or primary and from reporting PM2.5 without also reporting PM10. Other issues with missing or inconsistent SLT-reported species are resolved via EPA's PM Augmentation routine.

The PM augmentation procedure is discussed in a conference paper, "EPA's PM Augmentation Procedure" presented at the 2012 International Emission Inventory Conference (http://www.epa.gov/ttn/chief/conference/ei20/session5/rhuntley.pdf). Where species cannot be estimated by simple addition or subtraction (e.g., estimating PM10-PRI from summing SLT-reported PM10-FIL and SLT-

reported PM-CON), the procedure applies EF ratios based on AP-42, ***Compilation of Air Pollutant Emission Factors*** (http://www.epa.gov/ttn/chief/ap42/index.html) to the SLT-reported species.

The ratios documented in the "PM Calculator" tool (http://www.epa.gov/ttn/chief/tools/pm_calculator_condensibles.zip) are a function of the SCC (source classification code) for the emission process and PM controls. In many cases, the information contained in this "PM Calculator" relies on general (and sometimes older) emission factors, which are not necessarily applicable to the specific stationary source being inventoried.

Based on the development, evaluation, and revision of previous source test Methods 201A and 202 (revised methods are also known as OTM 27 and OTM 28), data became available through the Information Collection Request (ICR) process for stationary source boilers. The ICR for the boiler MACT collected this type of test data from boilers across the US targeted for regulation under the MACT rules. While the primary motivation for these tests was measurement of air toxics for relevant MACT rules, many of the tests likely included measurements for the condensible and filterable portions of PM for the boilers tested. Since the rule development process did not need this additional information, it was not extracted and compiled from the raw test reports. It is also possible that test reports for facilities contain information on the chemical speciation of the condensable and filterable portions of PM. If available, such source-specific test data could be very useful to improve EPA's PM inventories, and, in turn, help improve air quality model outputs. Significant current "issues" with existing PM emissions data and model outputs include the following, the objectives of this work assignment address:

- The PM-condensable fraction of total directly emitted PM is highly uncertain for most stationary source categories, including for boilers.
- The composition of PM-CON used in air quality models is currently assumed to be the same as the PM2.5-FIL portion largely due to the fact that there is no information on the chemical composition of PM-CON for most stationary source categories, including boilers. Any data that are available through the newly generated data from Boiler MACT ICRs that could help with this issue is greatly needed.
- Before- and after controls- information is lacking for PM emissions from large stationary sources. To the extent these ICR reports contain such information, it would be very useful to recover and evaluate.

PURPOSE/OBJECTIVE:

The purpose of this work assignment is to identify and consolidate for review and evaluation PM and PM-compositional information available from ICR Test data collected as part of the boiler MACT rulemaking. The focus of the review will be on available PM data, and more specifically, the availability of PM-CON and PM-FIL data for this stationary source category. For those units that do have PM-CON and PM-FIL data available, this review will consist of looking further at the detailed test reports available for chemical speciation data of the PM-CON and PM-FIL components. And beyond that, a review should be conducted to assess whether speciation data exists for any of the units before and after controls (such as scrubbers and ESPs). The Boiler MACT database available on-line and the more detailed associated test reports contain potentially useful information for this effort. Results from the data review shall be evaluated and organized in formats specified below in the individual tasks.

Overall objectives include:

- Investigation of Boiler MACT emissions database for readily available information on PM-CON and PM-FIL for individual sources
- Investigation of the more detailed test reports associated with the Boiler MACT emissions database for any further information on the chemical speciation of the PM-CON and PM-FIL for individual sources
- Comparing ICR-based PM-CON and PM-FIL and the 2008 v3NEI PM-CON and PM-FIL for those same sources with documentation on how matching was done to enable comparison
- In the event not enough data are found to conduct the desired reviews and evaluation, analyze the available data to determine how best to apply to NEI data development for improvement of PM emission estimates.

III. STATEMENT OF WORK (SOW):

Deliverables in each task depend on successful completion of the preceding task. The contractor shall initiate work in subsequent tasks upon approval by the WAM to proceed.

Task 1: Work Plan, Cost Estimate, and Project Monitoring

The contractor shall prepare a work plan describing the technical approach for each of the tasks in this work assignment. In addition the contractor shall provide a cost and labor estimate for the total work assignment and the cost and labor required to complete each of the work assignment tasks. The contractor shall plan for biweekly technical conference calls to brief the WAM and EPA team on progress or issues to complete each task. Monthly progress reports are required by the contract deliverables. Monthly reports must contain a summary of technical progress and work assignment cost information as required by the contract.

The contractor shall prepare a work plan, submit monthly progress reports, provide P-level estimates of resources for each task and subtask in any provided cost estimate, review and quality assure all work products, and keep the WAM informed of any problems that may impede project performance or delivery dates, along with any corrective actions needed by the Contractor or the WAM to solve such problems.

This has been determined to be a "Category IV" project for quality control and assurance purposes, based on the OAQPS Quality Management Plan (QMP). *The contractor shall include the quality assurance project plan (QAPP) within the work plan that is consistent with the category IV requirements.*

All deliverables of software and data need to be provided with documentation of the quality assurance steps and metrics that allow the WAM to confirm that the quality assurance steps have been performed.

Task 2: Search for and Report PM-FIL and PM-CON data

The contractor shall extract all PM-FIL and PM-CON data from the boiler MACT emissions database provided by the WAM. The most current Boiler MACT emissions database is available at http://www.epa.gov/ttn/atw/boiler/boilerpg.html. The WAM shall provide an example of the desired spreadsheet format for display of extracted data. The contractor shall screen those sources indicated to have available PM data, and gather the data into a spreadsheet with enough meta information to enable the analysis for subsequent tasks. Examples of meta information include test method(s) used, facility name, facility/ unit/ process identifiers, locational coordinates, fuel type, emission rates, annual emissions

(tons/year), other specific data needed to match to facilities/boilers that are in the NEI, and any other comments. The contractor shall send a sample of the data collection results to the WAM for review and approval before completing the exercise for all identified facilities.

Task 3: Compare data obtained in Task 2 from ICRs to data in NEI

Once the PM-CON and PM-FIL data available from the Boiler MACT emissions database has been indexed as a result of Task 2, the contractor shall compare those data (if the ICR data contains emission rates, they should be converted to annual emissions (tons/year) to facilitate comparison to the NEI) to data in the 2011 NEI for those same sources. With regard to matching to sources in the NEI, EPA has matched a select number of the larger facilities and units to the ICR Boiler MACT data for Hg, but largely nothing else has been matched. Furthermore, we have previously learned that some of the testing done for the ICR used fuels that were not actually used during the most recent inventory years. For example, boilers that could burn oil were, for purposes of the ICR, tested while burning oil, but oil may not have been the primary fuel and basis of emission estimates reported to the NEI. Thus, the contractor should carefully ensure that proper matches are made between ICR and NEI boilers, e.g., a lack of match in fuel type may not be a sufficient reason to not be able to match a boiler between the ICR and the NEI.
Sources that are not in the NEI but available in the ICRs should be documented. The fuel switching issue noted above may also be a factor in this comparison. Full documentation should be provided on the comparisons made and how the calculations were done to convert any emission rates into actual emissions.

Task 4: Inspect data obtained in Task 2 for chemical speciation

EPA has organized the detailed Boiler MACT test reports. The reports as well as the "tracking" sheet can be found at: G:\USER\MACT_ICR FULL TEST REPORTS AND LAB DATA\Boiler_CISWI Test Reports and Lab Data. If the contractor cannot directly access this information, the WAM shall provide all of this information via a CD (or via FTP) that contains specific pollutant and method information for the Boiler MACT facilities. The contractor shall review the detailed test reports for facilities identified in Task 2 as having PM-CON and PM-FIL data by test Methods 201A/202 and/or OTM 27/28. The objective of this review is to determine if any of those facilities have further information on the chemical speciation of either PM-CON or PM-FIL, or both. The full suite of chemical composition of PM data would include: sulfates, nitrates, organic material, elemental carbon, and trace elements. Typical methods used to determine chemical composition include but are not limited to Method 201A, Method 202 (post 2010), Other Test Method 27 (OTM-27) Other Test Method 28 (OTM-28) and Method 29. The contractor shall identify detailed test and laboratory reports and document ANY information that is available using these test methods. To help EPA gauge how many reports can be evaluated based on the available resources for this WA, the contractor shall initially limit their search to a maximum of 50 test reports. The resulting data should be provided in an Excel spreadsheet with meta-data that will help identify the source of interest as well as the emissions that are shown. All of the meta-data included in Task 2 (including the PM-CON and PM-FIL emissions) should be included in the data set provided here as well.

In addition to documenting any chemical speciation data available by individual source, the contractor shall inspect the available data to see whether there is information on chemical speciation before and after any controls (such as scrubbers, ESPs, and other control devices used in Boilers for emission reductions). If such data are available, the contractor shall report those data with enough information (and in concert with the database developed above in Task 3) for EPA to understand how the chemical components of PM-CON and PM-FIL (or whatever data are available) change based on the stated controls. If no such before/ after controls

information is available for any of the sources tested, the contractor shall note that in the comment field of the spreadsheet provided as part of this task.

Task 5: Repetition of Tasks 2-4 for an independent dataset

EPA shall provide a dataset (Excel) based on testing that was conducted at EPA's ORD facilities in RTP, NC. The contractor shall review the data provided and identify tests conducted on boilers. These test data shall then be reviewed for information on PM-CON and PM-FIL, with resulting data summaries as detailed in Tasks 2-4 for the Boiler MACT ICR data. The contractor shall provide a separate database for the results from this task. As resources allow, and as second priority within this task, the contractor shall also look at the other non-boiler sources available in this dataset and report summary PM and compositional data for those stationary sources.

Task 6: Analyze the Data Found and Determine It Can be Applied to Inventory Development

If not enough data are found to complete any of the analyses identified In the previous tasks, EPA would like the analysis to determine the best way to apply the data to inventory development. Analysis to determine whether application by fuel type, coal type or oil type, control type and even boiler size would be warranted - using statistics to determine whether the variations are statistically significant and could be applied to inventories. Such analyses should be included by the contractor in the final report.

Task 7: Final Report

Upon completion of all the Tasks above, the contractor shall prepare a brief final report (not to exceed 25 pages except as permitted by the EPA WAM) that outlines all the procedures employed to arrive at the final datasets provided to EPA in Tasks 2-5 above. The report shall note any caveats in the data as well as any other information that would be required for someone else to reproduce these efforts. In particular, the report shall address how the ancillary information was accessed and processed into the final spreadsheets/databases in Task 4.

IV. SCHEDULE OF DELIVERABLES

DELIVERABLES	SCHEDULE	TASK
Work Plan and Cost Estimate Project Monitoring: • Status report for on-going tasks • Progress report	20 days after effective date of this Work Assignment Every 2 weeks via email Monthly	Task 1
Report of PM-FIL and PM-CON data by specific boiler type • Initial assessment of which boilers contain PM data with PM-CON/PM-FIL and relevant meta data. Final (preferably Excel database) of PM-CON and PM-FIL data (in tons) along with all relevant meta-data.	30 days after the effective date of this work assignment	Task 2
Summary comparison of extracted PM-CON and PM-FIL data in Task 2 to data for same boilers in the NEI 2011. • An Excel spreadsheet that compares the PM-CON and PM-FIL	45 days after the effective date of this work assignment	Task 3

emissions from Task 2 to what exists in the NEI 2011 for those same sources. The NEI 2011 can be accessed from the CHIEF website (WAM will provide any additional NEI data needed beyond what is available on the CHIEF website). Also comment on units that are not in the NEI but are in the ICR test data (and contain PM information).		
Report any PM chemical speciation data extracted from detailed test reports • PM compositional information shall be reported for those boilers that were identified as having PM-CON and PM-FIL data in Task 2. This database should have the same data as in Task 2 with added columns for the any chemical constituents of PM reported as part of the ICR testing. Any available species data shall be reported with appropriate units and meta-data to make the data fully understandable to EPA. Speciation information should also record control information, e.g., before and after controls as contained in the data. Use of Excel spreadsheets to report final data and summaries would be the preferred option.	65 days after the effective date of this work assignment	Task 4
Repeat Tasks 2-4 for independent dataset to be provided by EPA/WAM	75 days after after the effective date of this work assignment	Task 5
Analysis to determine how the data found can be directly applied to emissions inventory development	90 days after the effective date of this work assignment	Task 6
Final Report	120 days after the effective date of this work assignment	Task 7

EPA

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number: 3-14

☐ Other ☒ Amendment Number: 000001

Contract Number	Contract Period	Title of Work Assignment/SF Site Name
EP-D-11-006	04/29/2011 To 03/31/2015	Boiler MACT ICR PM Emissions
	Base Option Period Number 2	

Contractor: EASTERN RESEARCH GROUP, INC.

Specify Section and paragraph of Contract SOW:

Purpose:
- ☐ Work Assignment
- ☒ Work Assignment Amendment
- ☐ Work Plan Approval
- ☐ Work Assignment Close-Out
- ☐ Incremental Funding

Period of Performance: From 07/30/2013 To 03/31/2014

Comments:
The purpose of this work change is to add 35 hours to the WA at no additional cost to the Government. This document is IAW the CMM 7.3.5.1(D)

☐ Superfund — Accounting and Appropriations Data — ☒ Non-Superfund

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

SFO (*Max 2*) ☐

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1										
2										
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4										
5										

Authorized Work Assignment Ceiling

	Cost/Fee:	LOE:
Contract Period: 04/29/2011 To 03/31/2015		
This Action:		
Total:		

Work Plan / Cost Estimate Approvals

	Cost/Fee:	LOE:
Contractor WP Dated:		
Cumulative Approved:		

Work Assignment Manager Name: Venkatesh Rao (Signature) (Date)	Branch/Mail Code:	
	Phone Number: 919-541-1173	
	FAX Number:	
Project Officer Name: Karen C. Watson (Signature) (Date)	Branch/Mail Code:	
	Phone Number: 919-541-3114	
	FAX Number:	
Other Agency Official Name (Signature) (Date)	Branch/Mail Code:	
	Phone Number:	
	FAX Number:	
Contracting Official Name: Rodney-Daryl Jones (Signature) (Date)	Branch/Mail Code:	
	Phone Number: 919-541-3112	
	FAX Number:	